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User's Manual

TP T 15HD 45 and TP T A 45

Twisted Pair Video and Audio Transmitters

68-924-01 **Rev. C**
05 05

www.extron.com

Extron Electronics, USA
1230 South Lewis Street
Anaheim, CA 92805
USA
714.491.1500
Fax 714.491.1517

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands
+31.33.453.4040
Fax +31.33.453.4050

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Building
Singapore 368363
+65.6383.4400
Fax +65.6383.4664

Extron Electronics, Japan
Kyodo Building
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082 Japan
+81.3.3511.7655
Fax +81.3.3511.7656

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www.camboard.de

Tel. 07131 911201
Fax 07131 911203

ce-info@camboard.de

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Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

FCC Class B Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805, USA

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Japan:
Extron Electronics, Japan
Kyodo Building
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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Quick Start Guide — TP T 15HD 45 / A 45

CAUTION *Installation and service must be performed by authorized personnel only. These units must be installed in accordance with national and local electrical codes.*

Step 1

Power off all devices and disconnect them from the power source.

Step 2

Connect the UTP cable from the receiver to the 8-pin connector on the TP T 15HD 45. To wire the connector, see *Rear Panel Connectors* in chapter 2 for the pinout table.

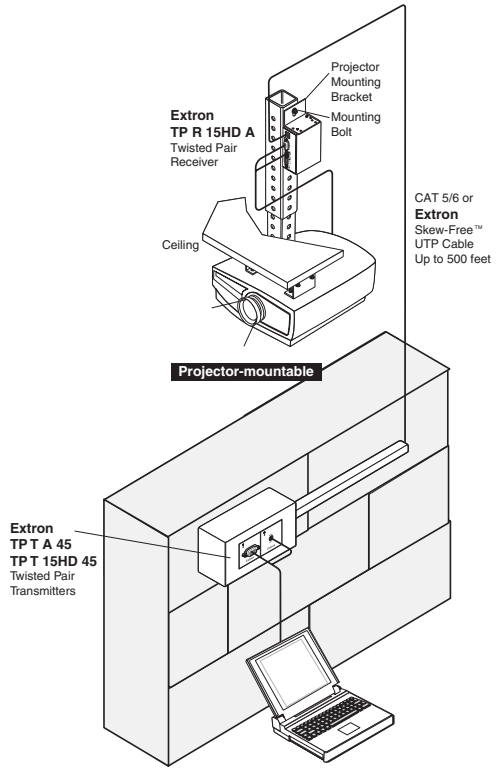
CAUTION *Do not connect the TP T 15HD 45 to a computer data or telecommunications network.*

Step 3

Connect the external power supply to the transmitter.

Step 4

Using the 15-pin front panel HD connector, attach a computer input to the transmitter and a display output to the receiver. See the example application diagram below.



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Quick Start Guide — TP T 15HD/A 45, cont'd

Step 5

If the TP T A 45 is being installed, connect the TP T A 45 to the TP T 15HD 45. See *Rear Panel Connectors* in chapter 2.

NOTE *The TP T 15HD 45 may be used as a stand-alone, video-only module without the TP T A 45.*
The TP T A 45 derives its power from the TP T 15HD 45.

Step 6

Connect and power up all input and output devices, then apply power to the TP T 15HD 45 power supply and test for the display and/or audio outputs. If a problem is encountered, check all connections before proceeding further.

Step 7

If the previous display and/or audio test was successful, power off and disconnect all equipment, detach cables, and install the TP T 15HD 45 and TP T A 45 (if installed) modules. See *Mounting* in chapter 2.

NOTE *If the transmitter is to be wall-mounted and the power supply will be inaccessible, power must be applied to the transmitter's power supply before final mounting.*

Step 8

Connect all device and power cables. Power up all input and output devices, apply power to the transmitter and receiver, and test for the display and/or audio.

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Chapter One

Introduction

Features

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The Extron TP T 15HD 45 twisted pair transmitter and the matching TP T A 45 audio input module provide a system for sending RGBHV, RGBS, RGsB, component, composite, or S-video and stereo audio signals over Extron Skew-Free™ A/V UTP cable or CAT 5/5e/6 UTP cable to a compatible TP or VTR receiver. An external 12 VDC power supply provides power to both the TP T 15HD 45 and the TP T A 45.

The TP T A 45 inputs unbalanced audio through a 3.5 mm stereo phono jack and outputs digital audio to the TP T 15HD 45 transmitter.

The following table specifies the maximum recommended transmission distances between the TP T 15HD 45 transmitter and compatible Extron receivers at 60 Hz.

Video format/ resolution	Recommended maximum range to VTR series and TP R 15HD A	Recommended maximum range to all other Extron receivers
Composite*	800 feet	1000 feet
S-video*	800 feet	1000 feet
Component*	800 feet	1000 feet
640 x 480	500 feet	1000 feet
800 x 600	400 feet	800 feet
1024 x 768	300 feet	600 feet
1280 x 1024	200 feet	400 feet
1600 x 1200	150 feet	300 feet

* VTR001 is not compatible with component, composite, or S-video.

NOTE *It is possible to exceed the recommended distances, however, image quality may be reduced.*

Features

- **45 mm opening compatibility —** The TP T 15HD 45 and TP T A 45 are designed to fit into a 45 mm mounting frame that is popular throughout Europe. The plate may be wall-mounted or floor box-mounted.
- **Extron TP product compatibility —** The TP T 15HD 45 and TP T A 45 are compatible with several Extron TP receivers and matrix switchers including the TP R 15HD A, TP R BNC A, TP R BNC AV, TPX 88, TPX 88A, and the VTR series (RGBHV and RGBS only).

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Chapter Two

Installation

Rear Panel Connectors

Front Panel Connectors and Indicators

Cabling and Setup

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Rear Panel Connectors

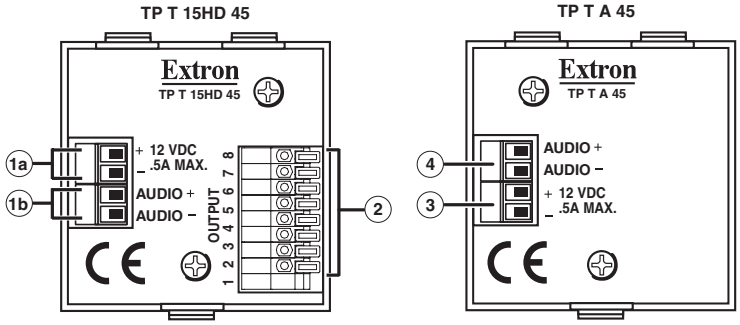


Figure 2-1 — Rear panel views

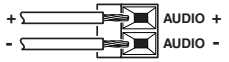
(1a) **Power input captive screw connector —** Connect the included 12 VDC external power supply to the 2-pole female direct insertion captive screw connector.

NOTE *The TP T 15HD 45 and the TP T A 45 share a single power supply. Neither one can be remotely powered by the attached receiver.*

WARNING *The two power supply leads must be kept separated while the power supply is plugged into an electrical outlet. Remove power before wiring.*

CAUTION *Power supply voltage polarity is critical. Incorrect voltage polarity can damage the power supply and the transmitter. Identify the power cord negative lead by the ridges on the side of the cord. When stripping the wire ends, please note that stripped wire ends that are too short may pull out from the captive screw connector and stripped wire ends that are too long could possibly touch and short together.*

(1b) **Captive screw digital audio input connector —** Connect the digital audio input cables from the TP T A 45 (if installed) to the 2-pole female direct insertion captive screw connector.



Digital Audio Input Captive Screw
Direct Insertion Connector

WARNING *Remove power before wiring.*

NOTE *The wire gauge should be 14 -22 AWG and the maximum distance between the modules should not exceed 25 feet.*

(2) **Video and audio output 8-pin spring force connector —** Attach a UTP cable from a TP receiver to the 8-pin spring force connector. Wire this connector according to the following pin assignment table.

Twisted Pair Pin Assignments

Pin	Signal	TIA/EIA T-568-A Wire Color	TIA/EIA T-568-B Wire Color
1	red / vertical sync +	white-green	white-orange
2	red / vertical sync -	green	orange
3	digital audio +	white-orange	white-green
4	green +	blue	blue
5	green -	white-blue	white-blue
6	digital audio -	orange	green
7	blue / horizontal sync +	white-brown	white-brown
8	blue / horizontal sync -	brown	brown

NOTE *T-568-A is recommended when using Extron UTP23SF cable.*

CAUTION *Do not connect the transmitter to a computer data or telecommunications network.*

Using the included tweeker tool and observing the correct wiring colors in the previous table, insert the stripped wire ends (see note below) of the twisted pairs into the spring force connector, as shown in the following diagram.

NOTE *Strip approximately 0.43" (1.1 cm) of insulation from each individual wire on one end of a TP cable.*

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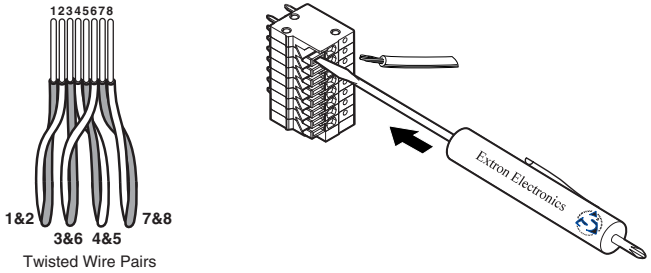
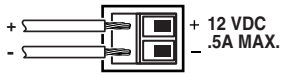


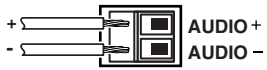
3 **Power input captive screw connector —** Connect power input cables to the 2-pole female direct insertion captive screw connector.



Power Input Captive Screw
Direct Insertion Connector

WARNING *Remove power before wiring.*

4 **Digital audio output captive screw connector —** Connect the digital audio output cables to the 2-pole female direct insertion captive screw connector.



Digital Audio Output
Captive Screw Direct Insertion Connector

WARNING *Remove power before wiring.*

Front Panel Connectors and Indicators

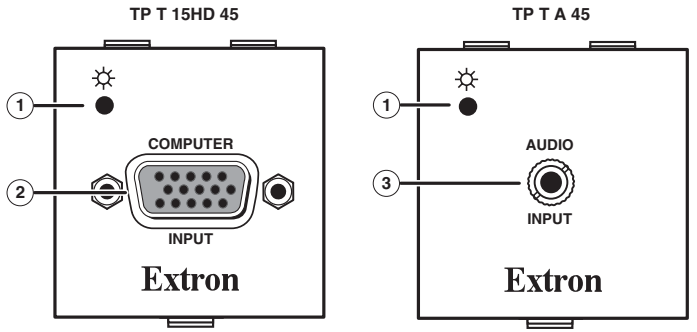
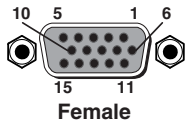


Figure 2-2 — Front panel views

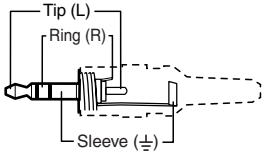
1 **Power LED indicator —** The LED lights green whenever power is applied.

2 **15-pin HD video input connector —** Connect computer video input.



NOTE *Input only sync signals, no video signals, on the sync pins, 13 and 14.*
For component video, use the R (R-Y) and R return pins (pins 1 and 6), G (Y) and G return pins (pins 2 and 7), and B (B-Y) and B return pins (pins 3 and 8).
For S-video, use the R, R return (C-chroma), G, and G return (Y-luma) pins.
For composite video, use the G pin and the associated return pin. For additional genlocked video signals, use the R, B, and associated return pins.
The TP T 15HD 45 and TP T A 45 are only compatible with the RGBHV and RGBS VTR series of receivers.

3 **3.5 mm stereo mini jack input —** Connect unbalanced audio to this stereo jack. Wire the male plug as shown on the right.



NOTE *Input only analog and line level audio signals on this connector.*

Cabling and Setup

To install the TP T 15HD 45 and TP T A 45 models, follow these steps:

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1. Turn all of the equipment off and, if applicable, disconnect it from the power source.
2. Connect the TP T 15HD 45 and its receiver to either end of the UTP cable. See *Cable testing* and *Skew delay problems* in this chapter.

NOTE *For best results, use Extron UTP23SF cable available in bulk or in various preterminated lengths. If necessary, regular CAT 5, CAT 5e, and CAT 6 cable may be used.*

3. Connect the external power supply to the TP T 15HD 45 and TP T A 45 (if installed). See *Rear Panel Connectors* in this chapter.
4. If the TP T A 45 is being installed, connect the TP T A 45 to the transmitter. See *Rear Panel Connectors* in this chapter.
5. Connect an output display device to the output connector of the receiver.
6. Connect a computer to the 15-pin video input connector of the transmitter.
7. Connect and power up all input and output devices, then apply power to the TP T 15HD 45 power supply and test for the display and/or audio outputs. If a problem is encountered, check all connections before proceeding further.
8. If the previous display and/or audio test was successful, power off and disconnect all equipment, detach cables, and install the TP T 15HD 45 and/or TP T A 45 modules. See *Mounting* in this chapter.

NOTE *If the transmitter or receiver is to be wall-mounted and the power supply will be inaccessible, power must be applied to the power supply before final mounting.*

9. Connect all device and power cables. Power up all input and output devices, apply power to the transmitter and receiver, and test for the display and/or audio.

Compatibilty with other Extron products

As a pair, the TP T 15HD 45 and TP T A 45 are compatible with the following Extron receivers and matrix switchers:

- TP R 15HD A
- TP R BNC A, TP R BNC AV
- TPX 88A

As a stand-alone transmitter, the TP T 15HD 45 is compatible with:

- VTR001, VTR001 AAP, and VTR001 MAAP (RGBHV/RGBS only)
- TPX 88

Cable testing

To ensure proper cable termination, each transmission cable system that uses CAT 5e or CAT 6 cable should be tested (Extron UTP23SF cable does not need to be tested). Testing the cable from the transmitter and receiver gives the most accurate indications of cable problems.

There are two varieties of cable runs: simple runs, in which a single cable is terminated only at the transmitter and receiver, and complex runs, which can include patch bays and multiple terminations and lengths of cable. In either case, the entire cabling system should be tested.

A complete test measures cable length and tests the wire map, attenuation, NEXT, PSNEXT, ELFEXT, PSELFEXT, return loss, ACR and PSACR. All of these tests are critical for digital data transfer. While all of these tests are important indicators of the quality of the cable termination, the most critical testing parameters for video transfer are wire map (T-568-A or T-568-B termination) and pair length measurements. The largest concern is equalization of skew between cable pairs. Cable systems of 300 feet or less should exhibit no transmission problems if they pass at least CAT 5e or preferably CAT 6-D5 channel certification testing.

The Microtest OMNI SCANNER 2 performs comprehensive certification testing to the proposed CAT 6 standards. Other manufacturers also make testing equipment. The tests include advanced diagnostics for troubleshooting the cause and location of many cable and termination problems. For simple installation testing, the Microtest MICRO SCANNER PRO tests wire map and cable length, including individual cable pair length.

Skew delay problems

CAT 5 TP cable can lead to registration errors between the red, green, and blue video signals. Pair skew can be measured with test equipment or identified by viewing a crosshatch test pattern with a critical eye to determine if either the red, green, or blue video image leads (appears to the left of) the other two video images. These images can be minimized or eliminated by one of the following methods:

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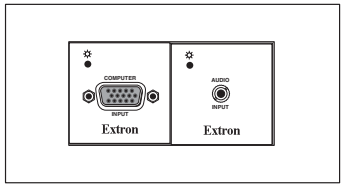
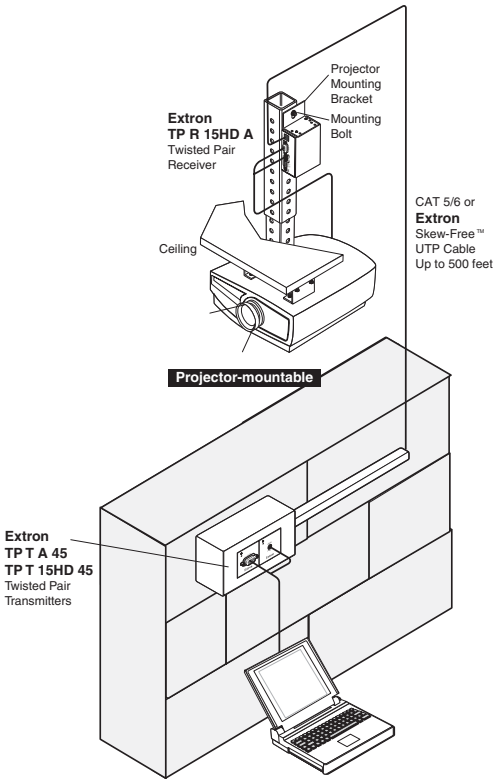
- Switch to Extron's UTP23SF cable.
- Add a skew compensation cable equal to the length of pair skew to the receiver's output.
- Install an SEQ 100 15HD Skew Equalizer on the receiver's video output and adjust the skew for the leading video image.

Mounting

The TP T 15HD 45 and TP T A 45 are designed to fit into a wall-mountable or floor box-mountable 45 mm mounting frame.



The following application diagram illustrates one example of installing these devices.



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Appendix

Reference Information

Specifications

Parts Lists

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Specifications

Video — video models

Number/signal type ..... 1 set of proprietary analog signals
Connectors
TP T 15HD 45 ..... (1) 8-pin spring force captive wire connector

Video input — video models

Number/signal type
TP T 15HD 45 ..... 1 analog RGBHV, RGBS, RGsB, component video, or S-video; or
1 S-video and 1 NTSC/PAL/SECAM composite video from a single source; or
3 NTSC/PAL composite video from a single source
Connectors
TP T 15HD 45 ..... (1) 15-pin HD female (Mac and Sun/SGI to VGA adapters are available)
Nominal level ..... 1 V p-p for Y of component video and S-video, and for composite video
0.7 V p-p for RGB
0.3 V p-p for R-Y and B-Y of component video, and for C of S-video
Minimum/maximum levels ..... 0.3 V to 1.45 V p-p with no offset at unity gain
Impedance ..... 75 ohms
Horizontal frequency ..... 15 kHz to 130 kHz
Vertical frequency ..... 30 Hz to 150 Hz
Return loss ..... <-30 dB @ 5 MHz
DC offset (max. allowable) ..... 100 mV

Video output — refer to the TP Receivers Family User's Manual, part #68-547-02

Audio — audio models

Number/signal type ..... 1 set of analog proprietary signals
Connectors
TP T A 45 ..... (1) 2-pin direct insertion captive screw connector
Frequency response ..... 20 Hz to 20 kHz, ±0.05 dB
THD + Noise ..... 0.03% @ 1 kHz, 0.3% @ 20 kHz at nominal level
S/N ..... >63 dB at maximum output (unweighted)
Crosstalk ..... <-80 dB @ 1 kHz, fully loaded
Stereo channel separation ..... >80 dB @ 1 kHz
CMRR ..... >33 dB @ 20 Hz to 20 kHz

Audio input — audio models

Number/signal type
TP T A 45 ..... 1 stereo, unbalanced
Connectors
TP T A 45 ..... (1) 3.5 mm mini jack
Impedance
TP T A 45 ..... >10k ohms, unbalanced, DC coupled
Nominal level ..... -10 dBV (316mV)
Maximum level ..... +5.5 dBu, (unbalanced) at 1%THD+N

NOTE *0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu.*

Audio output — refer to the TP Receivers Family User's Manual, part #68-547-02

General

Power
TP T 15HD 45 ..... 12 VDC, 1.0 A, external
TP T A 45 ..... Shared with the TP T 15HD 45 transmitter
Temperature/humidity ..... Storage: -40 to +158°F (-40 to +70°C) / 10% to 90%, noncondensing
Operating: +32 to +122°F (0 to +50°C) / 10% to 90%, noncondensing
Rack mount ..... No, but mountable in a 45 mm x 45 mm opening
Enclosure type ..... Metal
Enclosure dimensions
TP T 15HD 45, TP T A 45
Faceplate ..... 1.8" H x 1.7" W x 0.8" D (45 mm H x 45 mm W x 20 mm D)
Device ..... 1.1" H x 1.6" W x 1.2" D (29 mm H x 41 mm W x 30 mm D)
(Depth excludes connectors.)
Product weight
All models ..... 1.0 lbs (0.5 kg)
Shipping weight
All models ..... 3 lbs (2 kg)

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Vibration	ISTA 1A in carton (International Safe Transit Association)
Compliances	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *All nominal levels are at ±10%.*

NOTE *Specifications are subject to change without notice.*

Parts Lists

Included parts

Description	Part number
Power supply: universal 12 VDC, 1.0 A	28-071-01 (TP T 15HD 45 only)
Tweeker (small screw driver)	
TP T 15HD 45/TP T A 45	
User's Manual	
Power supply - ships with IEC power cord	70-055-01

Optional accessories

Description	Part number
VGA cable, 6', male-to-male	26-238-01
VGA with audio cable, 6', male-to-male	26-490-02
Enhanced Skew-Free™ A/V UTP cables (assorted lengths)	26-569-xx
Plenum Enhanced Skew-Free™ A/V UTP cables	26-570-xx
Enhanced Skew-Free™ A/V UTP bulk cable, 1000'	22-141-03
Plenum Enhanced Skew-Free™ A/V UTP bulk cable, 1000'	22-142-03
Plenum Enhanced Skew-Free™ A/V UTP bulk cable, 1000 meters	22-141-04

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Reference Information, cont'd

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